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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/902,774	07/10/2001	Katsutoshi Takeda	4970/01592	1362

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EXAMINER

MUTSCHLER, BRIAN L

ART UNIT	PAPER NUMBER
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1753

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DATE MAILED: 10/18/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/902,774

Applicant(s)

TAKEDA ET AL.

Examiner

Brian L. Mutschler

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 10 September 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Comments*

1. The rejection of claims 1-5 under 35 U.S.C. 112 has been overcome by Applicant's amendment.

### *Claim Rejections - 35 USC § 103*

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Younan et al. (U.S. Pat. No. 5,575,861).

Younan et al. disclose photovoltaic system for utilizing the maximum area in the installed location through the use of different sized solar cell modules (col. 6, line 60 to col. 7, line 10; fig. 2 and 4A-4C). In figure 2, Younan et al. show a module having seven tabs **32**, each containing a sub-module, or photovoltaic device **36** (col. 5, line 42). In figure 4A, Younan et al. show a module having three tabs **32**, each containing a photovoltaic device **36**. Younan et al. also disclose that "the devices **36** may be interconnected in a series configuration, a parallel configuration or a mixed series-parallel configuration" and "by appropriately configuring the interconnections, current and voltage of the resultant combination may be controlled" (col. 5, lines 58-62).

Regarding claim 2, each device **36** is the same size. (Younan et al. also disclose smaller sub-modules **35**, as shown in fig. 4B and 4C.)

Regarding claims 3 and 4, the voltage is controlled through the use of different wiring configurations (col. 5, lines 58-62).

The method of Younan et al. differs from the instant invention because Younan et al. do not explicitly disclose configuring the different size solar cell modules to yield equal output voltages.

However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the method of Younan et al. to utilize equal output voltages because Younan et al. disclose a method for controlling the output voltage, and making the output voltages equal by "appropriately configuring the interconnections" would simplify the installation process by making all modules similar.

4. Claims 5-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Younan et al. (U.S. Pat. No. 5,575,861), as applied to claims 1-4 above, and further in view of admissions of prior art in the instant application.

Younan et al. disclose a method for installing solar cell modules and solar cell modules as recited in the claims 1-4 of the instant invention, as explained above in paragraph 4.

Regarding claim 5, the method of Younan et al. differs from the instant invention because Younan et al. do not disclose the use of a plurality of power generating regions within the solar cell sub-modules.

In the disclosure of the instant application, a conventional solar cell module is disclosed comprised of a plurality of sub-modules **112**, wherein each sub-module **112** contains a plurality of solar cells (p. 3, lines 5-16). Because large solar cells are more difficult to manufacture, it is common in the art to use a plurality of smaller solar cells connected in parallel or series to generate the desired voltage.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the method of Younan et al. to use sub-modules comprised of a plurality of solar cells, or power generating regions, as disclosed prior art in the instant application, because it is well known in the art to use a plurality of small solar cells connected in series or parallel to generate the desired voltage.

Regarding claim 6, Younan et al. disclose a solar cell module comprising a supporting member **28, 80** upon which a plurality of solar cell sub-modules **36, 82** are arranged (fig. 2 and 16). A wiring member **38** connects the sub-modules **36, 82** to one another (fig. 2 and 16). Younan et al. also disclose the use of an encapsulating member **88** covering the exposed module (col. 10, line 7).

The module of Younan et al. differs from the instant invention because Younan et al. do not disclose the use of a plurality of solar cells within each sub-module.

In the disclosure of the instant application, a conventional solar cell module is disclosed comprised of a plurality of sub-modules **112**, wherein each sub-module **112** contains a plurality of solar cells (p. 3, lines 5-16). Because large solar cells are more difficult to manufacture, it is common in the art to use a plurality of smaller solar cells connected in parallel or series to generate the desired voltage.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the method of Younan et al. to use sub-modules comprised of a plurality of solar cells, or power generating regions, as disclosed prior art in the instant application, because it is well known in the art to use a plurality of small solar cells connected in series or parallel to generate the desired voltage.

Regarding claim 7, Younan et al. disclose a solar cell module comprising a supporting member **28** upon which a plurality of solar cell sub-modules **36** are arranged (fig. 2). A wiring member **38** connects the sub-modules **36** to one another (fig. 2). Younan et al. further disclose that "it may be desirable to dispose the jumpers **38** comprising the interconnect system so that they extend further into the overlap portion **30** of the strip **28**, so that they will be covered by adjoining shingles when in use" (col. 5, lines 62-66).

The solar cell module of Younan et al. differs from the instant invention because Younan et al. do not disclose the use of a metal base having a raised portion and a suspended portion, wherein the connection between sub-modules is made between the metal base and the base of the raised portion.

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In the instant application, a conventional solar cell module is shown in figures 3 and 4, wherein the module has a metal base **111** having a raised portion **122** with a first engaging portion **121** and a base section **125**, and a suspended portion **124** with a second engaging portion **123** (p. 3, line 5 to p. 4, line 21). This configuration is commonly used in solar cell modules being mounted on roofs because it allows very rapid installation and also enables air to circulate underneath the solar cells and cool the modules.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the solar cell module of Younan et al. to use a support member having a metal base with a raised portion and a suspended portion, wherein each have complimentary engaging portions, as disclosed as prior art in the instant application, because it is well known in the art to use a metal base having a raised and suspended portion with engaging members that allow rapid installation and also allow air to circulate and cool the solar cell modules. It also would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the solar cell module of Younan et al. to make the electrical connection between the metal base and the base of the raised portion because Younan et al. teach that "it may be desirable to dispose the jumpers **38** comprising the interconnect system so that they extend further into the overlap portion **30** of the strip **28**, so that they will be covered by adjoining shingles when in use", which would protect the electrical connection from the effects of the weather and sunlight (col. 5, lines 62-66).

***Response to Arguments***

5. Applicant's arguments filed September 10, 2002 have been fully considered but they are not persuasive.

6. Regarding the rejection of claim 1 under 35 U.S.C. 103, Applicant has argued that there is no suggestion in the prior art to have different-sized modules having the same output voltage (see pages 3-4 of Applicant's response). Younan et al. teach the formation of different-sized solar cell modules and also teach that the output of the module can be regulated by changing the interconnections within the module (col. 5, lines 60-62). It is the Examiner's position that it would have been obvious to one having ordinary skill in the art at the time the invention was made to make the output of each module the same for the following reasons. As explained above in section 3, making the output of each module similar would simplify the installation process. Modules are made to simplify the installation of a plurality of parts as a single *modular* entity, and are most commonly made to have interchangeable characteristics. As seen in U.S. Pat. No. 4,089,705 issued to Rubin, photovoltaic modules are disclosed having different shapes and common outputs (see fig. 1; col. 2, line 62 to col. 3, line 7). JP 11-195803 discloses a method and apparatus for maximizing the use of space available by making modules of different length and that it is preferable to allow the module to "have almost the same current characteristics" and "because when the current characteristics of the respective cells [and therefore modules] are different from each other, the series, parallel connection to realize a desired current characteristic becomes complicated" (please see English abstract). Therefore, it is the Examiner's opinion that it would have



been obvious to one skilled in the art would have found that making the output of each module similar would simplify the installation of the modules.

7. Regarding claim 2, Applicant has stated “the examiner suggests that the element indicated by the numeral 35 of Younan corresponds to the sub-module of the present invention...[but] this is simply another module that is smaller in size” (see page 4 of Applicant’s response). The module disclosed by Younan et al. in Figures 2, 4B and 4C is represented by the reference signs **26**, **46** and **48**, respectively. The sub-modules are represented by the reference signs **32**, **35** and **36**. Younan et al. discloses “the photovoltaic roofing member **26** of Fig. 2 further includes an interconnect system for establishing electrical communication between the photovoltaic devices **36**” (col. 5, lines 51-53). In other words, interconnects connect the sub-modules electrically within the module.

8. Regarding claim 6, Applicant has argued, “layer 88 merely covers the exposed end portion of the solar cell” (see page 5). Figure 18 clearly shows the cover **88** completely covering the solar cell **82** and excess area beyond the bounds of the solar cell. Since the wiring must be connected to the solar cell, it is impossible for the cover **88** not to cover the wire and still contact the solar cell. Furthermore, Fig. 3 shows a cover **40** that “extends across the entire [light incident] surface of the photovoltaic device **36** and onto the overlap portion **30** of the strip **28** of roofing material” (col. 6, lines 13-16).

9. Regarding claim 7, Applicant has argued, “there is not the slightest suggest in any prior art to make the combination suggested by the examiner” (see page 6). As

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stated above in section 4, it is the position of the Examiner that modifying the module of Younan et al. to use the structure of the conventional module because it allows for a more rapid installation. The overlapping portions of the conventional interlock with the module above and the module below, thereby defining the exact location of the module without the need to measure the correct placement of the module, as would be required when installing the modules of Younan et al. Therefore, it would have been obvious to one having ordinary skill in the art to use the conventional mounting structure in the modules taught by Younan et al. because it simplifies and minimizes the time required for installation.

### ***Conclusion***

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian L. Mutschler whose telephone number is (703) 305-0180. The examiner can normally be reached on Monday-Friday from 8:00am to 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (703) 308-3322. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

  
NAM NGUYEN  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 1700

blm  
October 11, 2002